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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/069,404 | 05/06/2002 | Takeshi Uchida | 566.41259X00 | 3597 |

7590 09/22/2004

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EXAMINER

UMEZ ERONINI, LYNETTE T

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1765

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/069,404 | Applicant(s) UCHIDA ET AL. | |
| | Examiner Lynette T. Umez-Eronini | Art Unit 1765 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4-26 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is in response to amendment filed June 8, 2004. Applicants showed the Kaisaki et al. (US 6,194,317 B1) failed to teach a polishing medium comprising a water-soluble polymer along with the other limitations of the claimed invention (see Remarks, pages 7, 8, and 11-14). Hence, a new office action is presented.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, and 4-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Levert et al. (US PG PUB 20010054706 A1).

Levert teaches a chemical composition for spin etch planarization of copper surface (Abstract). The composition comprises an etching solution, which comprises: an oxidizing reactant such as H₂O₂ (same as applicants' oxidizing agent), a depassivating co-reactant such as H₂SO₄, acetic acid, organic acids and mixtures thereof (which is the same as applicants' metal-oxide-dissolving agent), means for adjusting diffusion,

which comprises an additive such as polyvinyl alcohol (same as applicants' water-soluble polymer) and carboxymethylcellulose (same as applicants' protective-film forming agent), (claims 1 and 2) and further comprises: EDTA (same as applicants' said protective-film forming agent is a nitrogen-containing compound), NH_4OH , H_2O_2 , in aqueous solution (Claim 6 and Tables 1-10), which reads on water. Hence the above reads on,

A polishing medium for chemical mechanical polishing, comprising an oxidizing agent, a metal-oxide dissolving agent, a protective-film forming agent, a water-soluble polymer, and water, **in claim 1;**

wherein said oxidizing agent is at least one of hydrogen peroxide, nitric acid, and hypochlorous acid, **in claim 7;**

wherein said metal-oxide dissolving agent is at least one of an organic acid, **in claim 8;**

wherein said protective-film forming agent is a nitrogen-containing compound, **in claim 9;**

wherein said protective-film-forming agent is at least one of a mercaptan, glucose and cellulose, **in claim 10;**

a polishing method comprising polishing a polishing object film of a metal with the polishing medium for chemical mechanical polishing according to claim 1, **in claim 11;**

wherein said polishing object film comprises at least one of copper, a copper alloy, a copper oxide and a copper alloy oxide, **in claim 12;**

wherein said water-soluble polymer is selected from the group consisting of polysaccharides, polycarboxylic acids and esters and salts thereof, and vinyl polymers; **in claim 18**; and

wherein said water-soluble polymer is selected from the group consisting of peptic acid, agar, polymalic acid, polymethacrylic acid, polyacrylic acid, polyacrylamide, polyvinyl alcohol and polyvinyl pyrrolidone, and esters and ammonium salts thereof, **in claim 19**.

Since Levert teaches examples of polymers which are the same as water-soluble polymers as the claimed invention, then it would be inherent wherein said water-soluble polymer has a weight-average molecular weight of 500 or more, 1,500 or more, and 5,000 or more, respectively **in claims 2, 20, and 21**.

Since Levert teaches examples of compounds that comprises the same chemicals as applicant's polishing medium, then using Kaisaki's polishing compounds in the same manner as the claimed invention would result wherein the polishing medium has a coefficient of kinetic friction of 0.25 or more, **in claims 4 and 13**, 0.35 or more, **in claim 22**, and 0.45 or more, **in claim 23**; an Ubbelode's viscosity of 0.95 mPa's (0.95 cP) or more and 1.5 mPa's (1.5 cP) or less, **in claims 5, 14, and 16**, of 0.96 mPa's to 1.3 mPa's, **in claim 24**, and of 0.97 to 1.0 mPa's, **in claim 25**; and a point-of-inflection pressure of 5 kPa (50 gf/cm²) or more, **in claims 6, 15, and 17** and of 10 kPa (50 gf/cm²) or more, **in claim 26**.

Allowable Subject Matter

3. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

ltue

September 15, 2004

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

